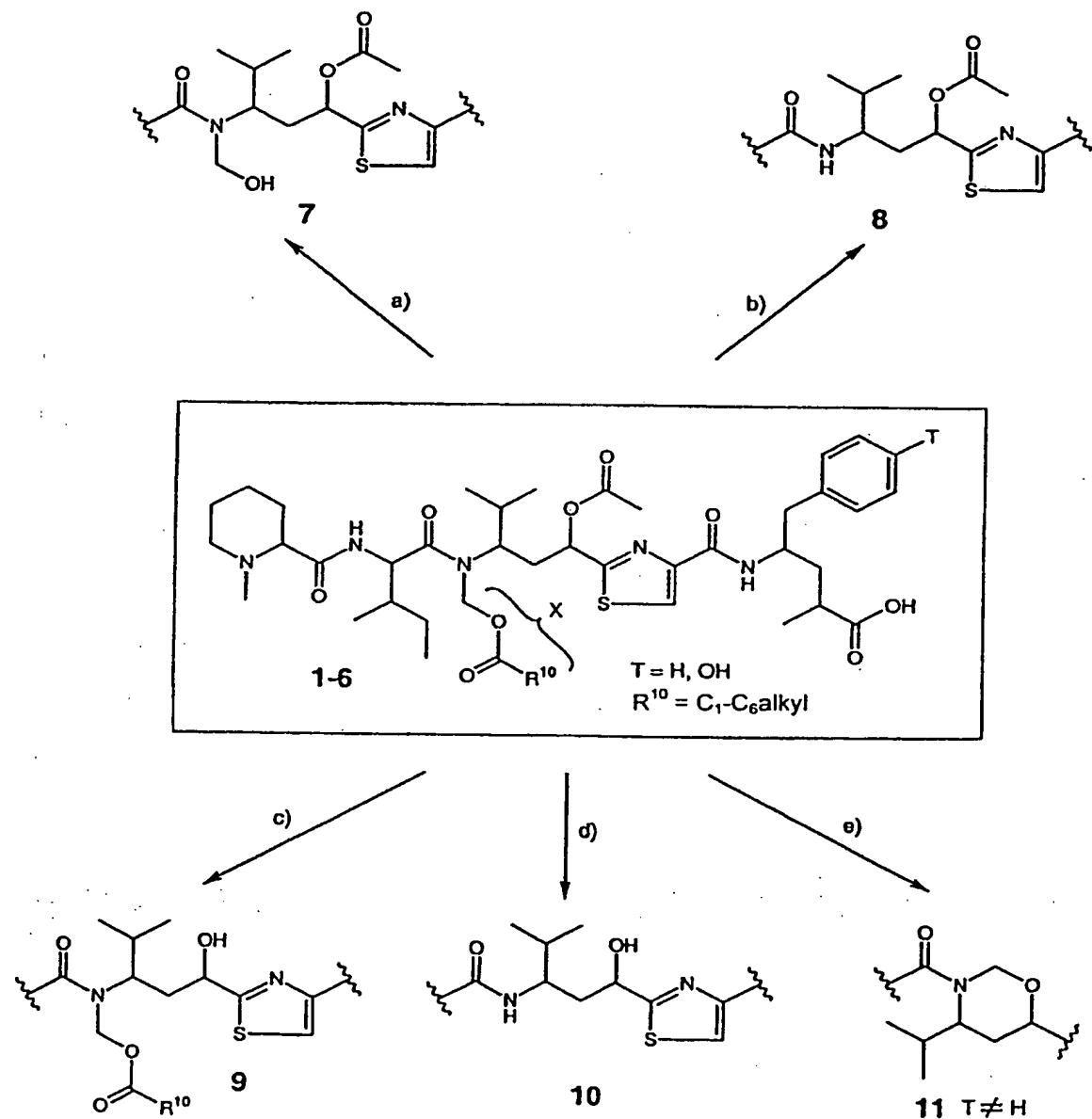


Figure 1



a) 0.1 M HCl, dioxane, 50°C; b) 0.1 M HCl, 100°C; c)  $NH_3$ , MeOH; d) 1 M NaOH, MeOH; e) 0.5 M HCl, 100°C

Figure 2

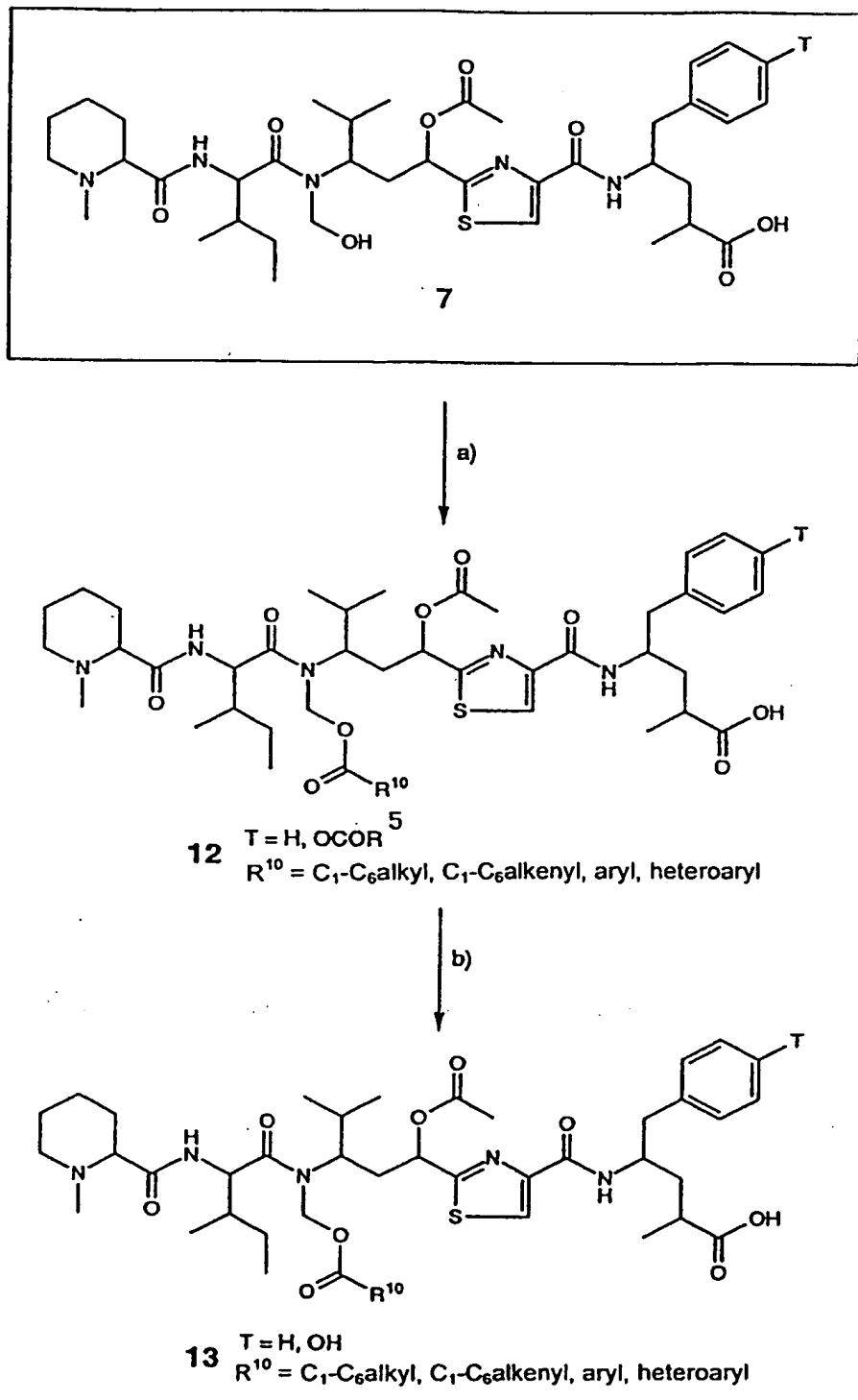
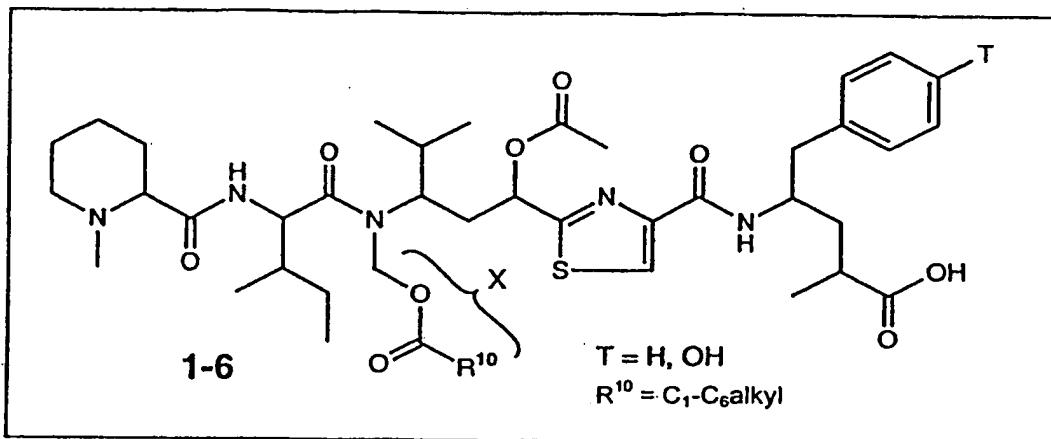
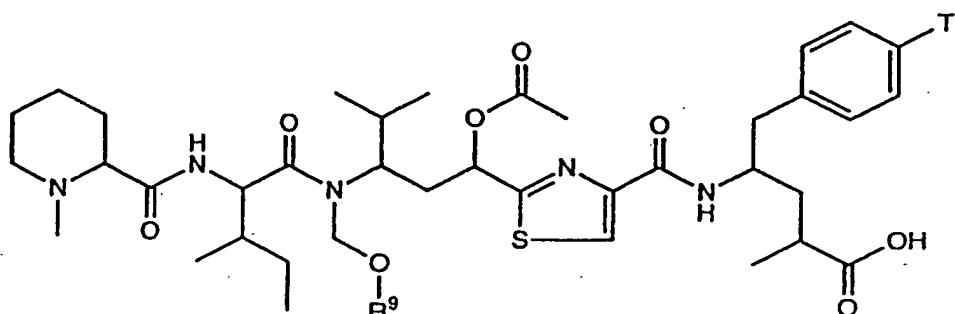


Figure 3



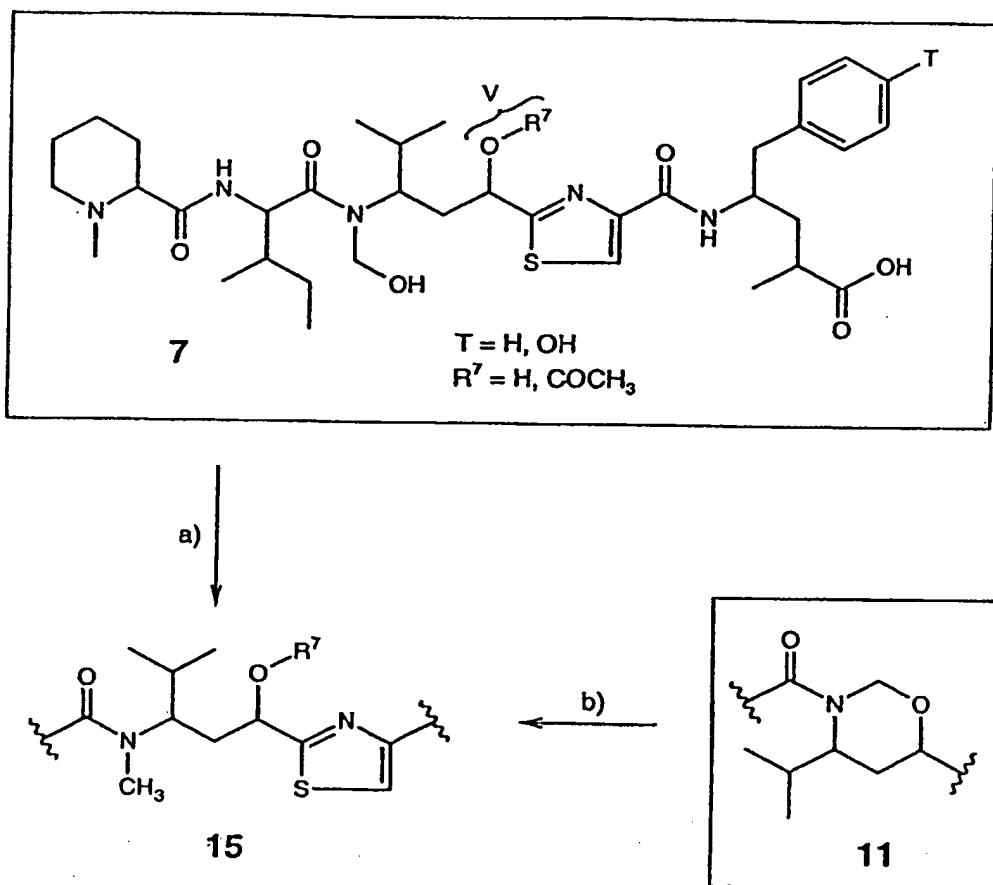
a)



**14** R<sup>9</sup> = C<sub>1</sub>-C<sub>4</sub>alkyl, alkenyl, aryl

a) p-CH<sub>3</sub>-C<sub>6</sub>H<sub>4</sub>SO<sub>2</sub>OH, R<sup>9</sup>OH, THF, 80°C

Figure 4



a)  $\text{NaCnBH}_3$ , TFA, MeOH; b)  $\text{NaCnBH}_3$ ,  $\text{Me}_3\text{SiCl}$ ,  $\text{CH}_3\text{CN}$

Figure 5

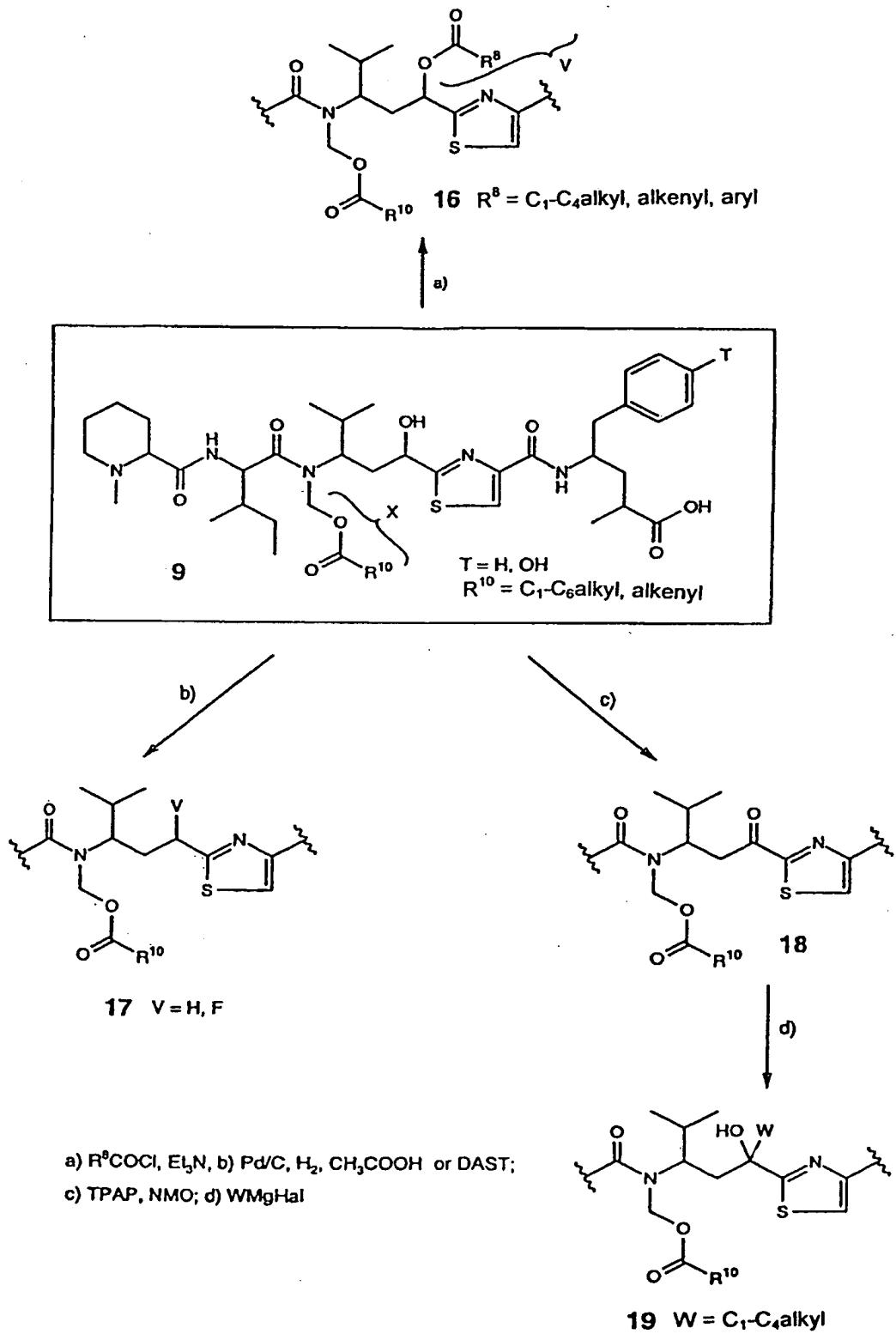
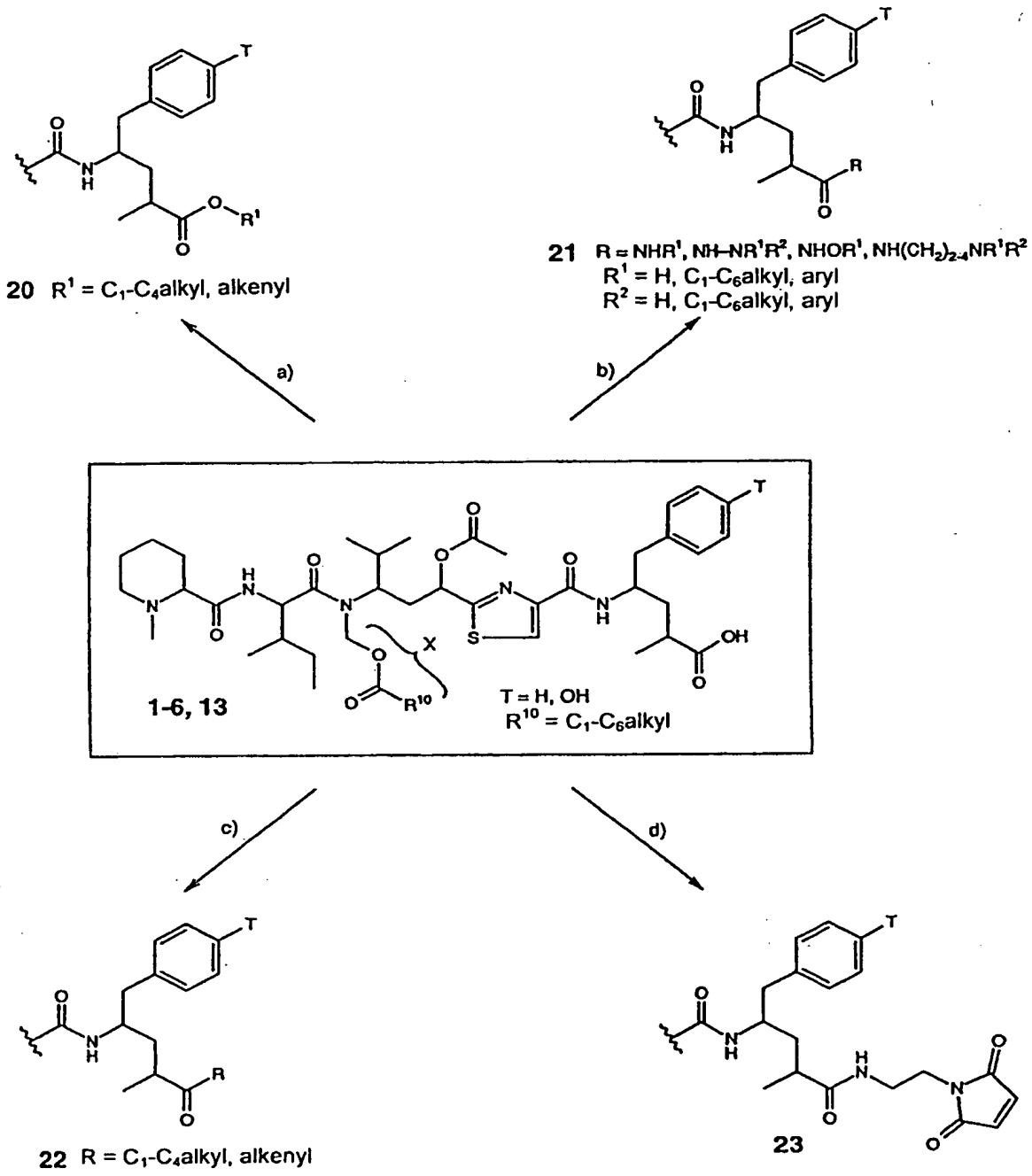


Figure 6

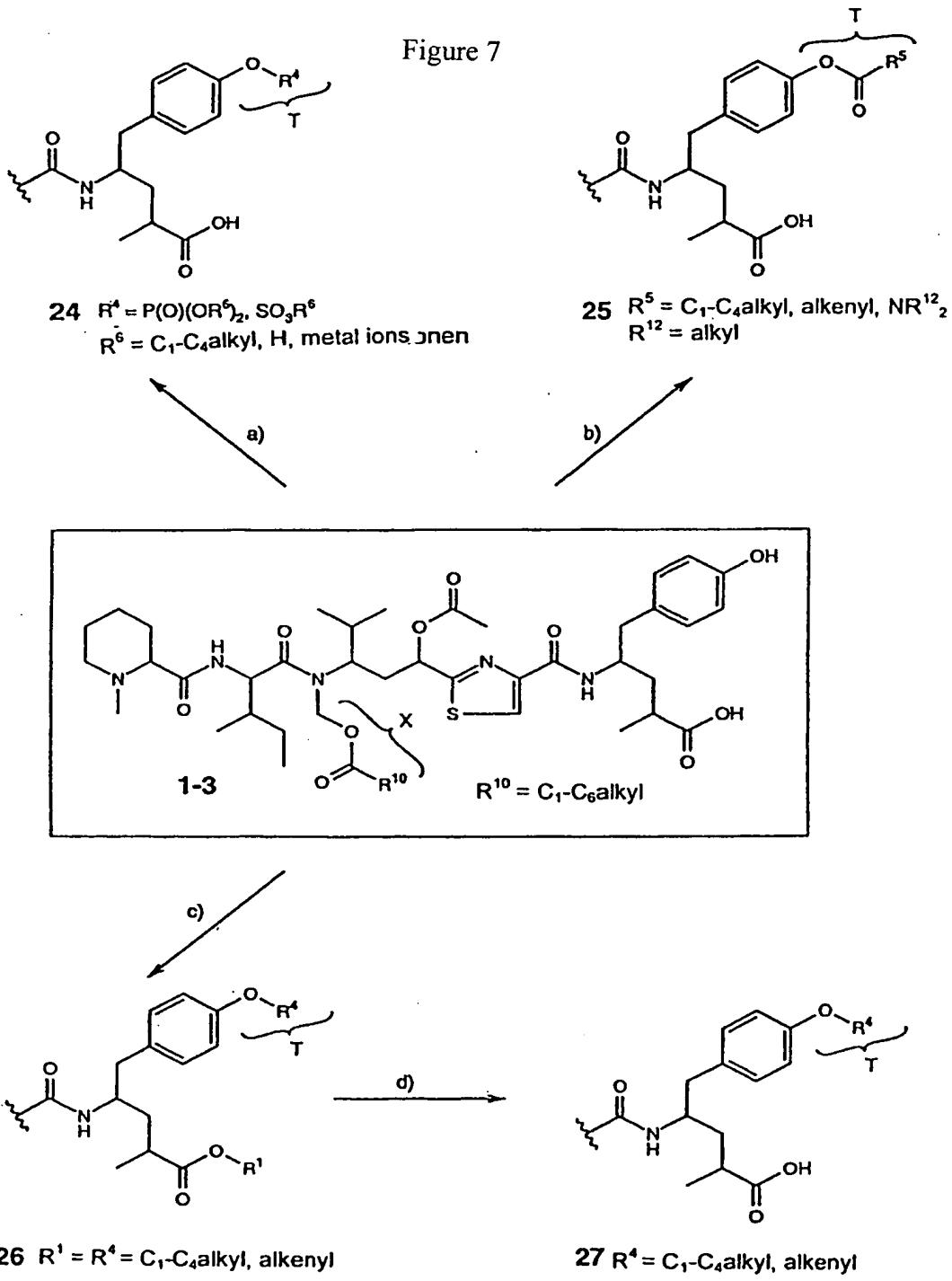


a) EDC, R'OH, DMAP,  $\text{CH}_2\text{Cl}_2$ ; b) EDC, RH,  $\text{CH}_2\text{Cl}_2$  or isobutyl chloroformate,  $\text{Et}_3\text{N}$ , RH, abs. THF

c) RLi; d) EDC, 1-(2-aminoethyl)-pyrrole-2,5-dione,  $\text{CH}_2\text{Cl}_2$

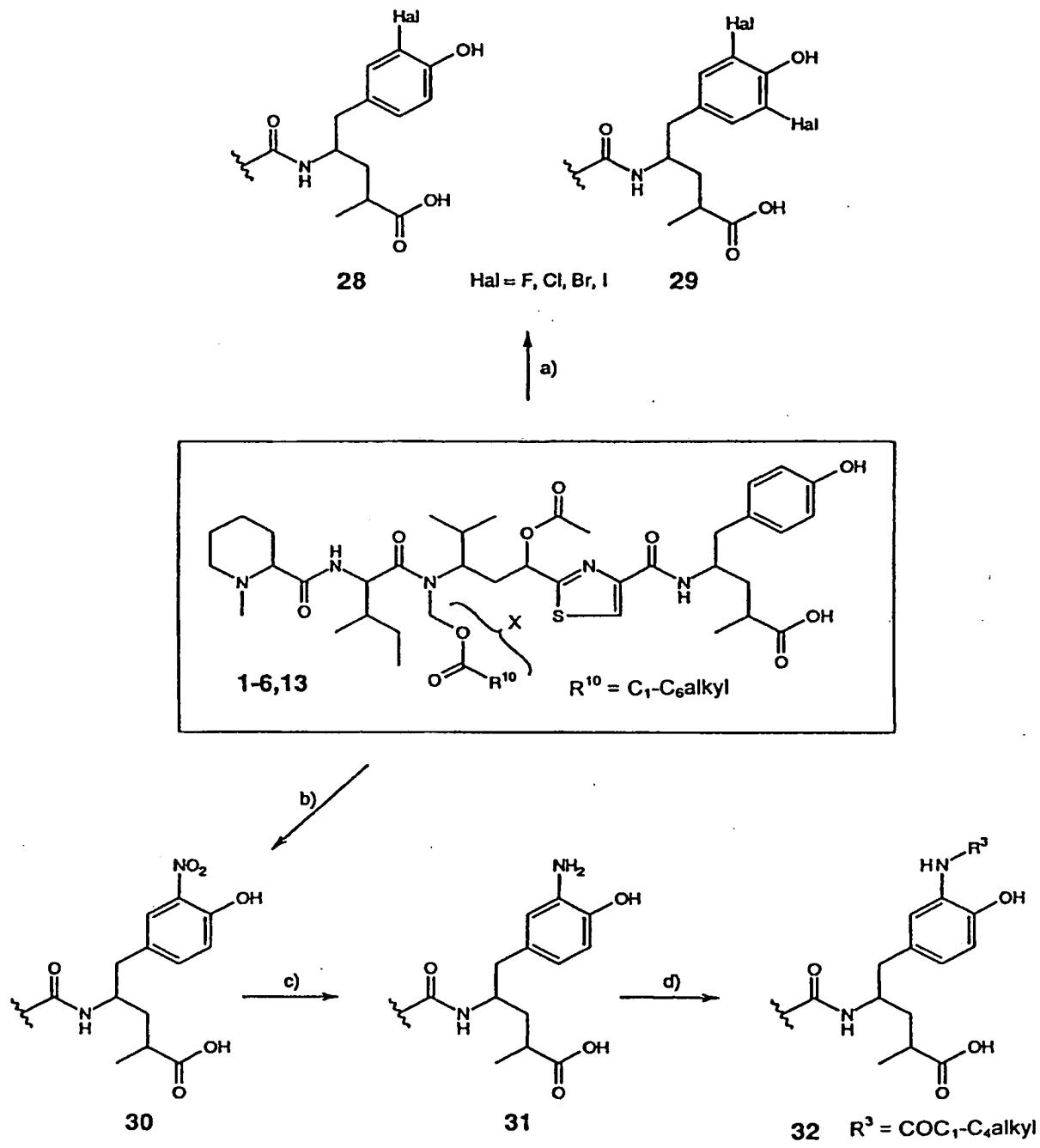
7 / 9

Figure 7



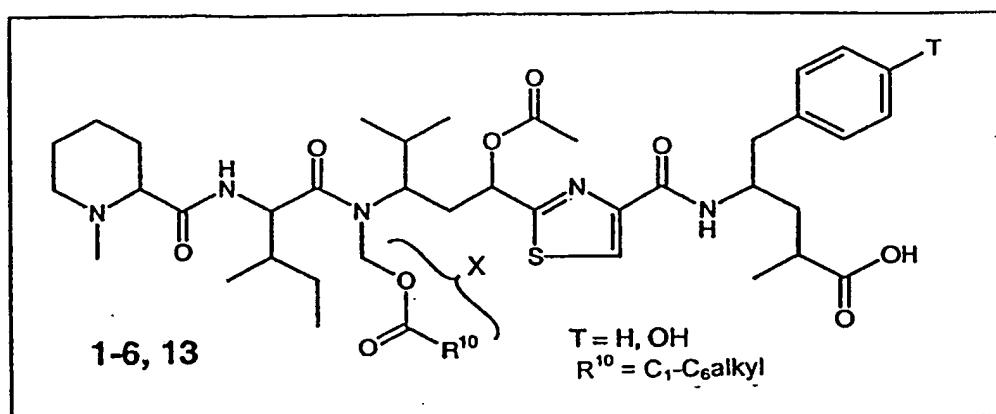
a)  $\text{P}(\text{O})(\text{OR}^6)_2\text{OH}, \text{I}_2$ , pyridine,  $\text{CH}_2\text{Cl}_2$  or pyridine- $\text{SO}_3\text{Na}$ ; b)  $\text{R}^5\text{COCl}, \text{Et}_3\text{N}$ , abs. THF;  
c)  $\text{Ag}_2\text{O}, \text{R}^4\text{I}, \text{CH}_2\text{Cl}_2$ ; for  $\text{R}^4 = \text{CH}_3$ :  $\text{CH}_2\text{N}_2$ , MeOH; d) pig liver esterase,  $\text{KH}_2\text{PO}_4$  buffer,  $36^\circ\text{C}$ ;

Figure 8

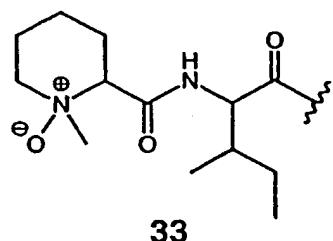


a)  $C_5Cl_5NF$  triflate,  $SO_2Cl_2$ , NBS,  $ICl$ ; b)  $NaNO_2$ ,  $CH_3COOH$ , EtOH; c)  $Pd/C$ ,  $H_2$ , EtOH; d)  $(R^3CO)_2O$

Figure 9

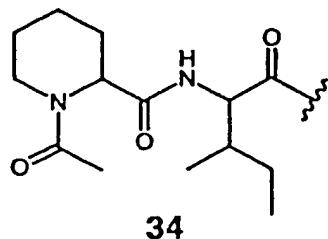


a)



33

b)



34

a) *m*-CPBA, CH<sub>2</sub>Cl<sub>2</sub>; b) Ac<sub>2</sub>O, 75°C